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GMD20 Series Carbon Dioxide Transmitters for Demand Controlled Ventilation Applications

The GMD20 series transmitters are designed for use in ventilation-related applications.

Features/Benefits

- Versatile transmitters
- Reliable measurement with sensor inside the duct
- Incorporates Vaisala CARBOCAP® Sensor - the silicon-based NDIR sensor
- Excellent long-term stability
- Negligible temperature dependence
- Ease of installation

The duct mounted Vaisala CARBOCAP® Carbon Dioxide Transmitter Series GMD20 is specially designed for Demand Controlled Ventilation (DCV). They are easy to install and require no maintenance. The recommended calibration interval is five years.

Vaisala CARBOCAP® Technology

The GMD20 Series Transmitters use the silicon-based Vaisala CARBOCAP® Sensor. The simple structure and reference measurement capabilities make this Single-Beam, Dual-Wavelength NDIR sensor extremely stable and reliable.

The temperature and flow dependences of the sensor are negligible. In addition, the measurement accuracy is not affected by dust, water vapor and most chemicals.

Versatile Transmitters

The GMD20 series transmitters can be used independently, or incorporated into building energy management systems. The series consists of duct mount units GMD20 and GMD20D. Version D has a display.

The duct units' compact sensor head design fits inside the ventilation duct, eliminating the risk of leaking gaskets and measurement errors.

In addition to the standard 0 ... 20 mA, 4 ... 20 mA and 0 ... 10 V outputs, there are two other options: one LonWorks® interface and a relay output. The relay output is standard with the display units.

Improve Indoor Air at Minimal Energy Costs

The use of the GMD20 series transmitters ensures the best possible control of air quality and results in considerable savings in energy consumption, maintenance and recalibration costs.

Technical Data

Performance

CARBON DIOXIDE MEASUREMENT	
Measurement range	0 ... 2000 ppm (nominal; can be calibrated for other ranges: 0 ... 5000 ppm, 0 ... 10,000 ppm, 0 ... 20,000 ppm)
Accuracy (including repeatability, non-linearity and calibration uncertainty)	± (2 % of range + 2% of reading)
Long-term stability	<±5 % of range / 5 years
Response time (63%)	1 minute
Warm-up time	1 minute, 15 minutes full specifications

Inputs and Outputs

Outputs	0 ... 20 or 4 ... 20 mA and 0 ... 10 V
Optional outputs	relay LonWorks® interface
Resolution of analog outputs	8 bits
Recommended external load:	
current output	max. 500 ohm
voltage output	min. 1 kohm
Operating voltage	nominal 24 VAC/DC (18 ... 30 VDC)
Connections	screw terminals, wire size 0.5 ... 1.5 mm^2
Power consumption	<2.5 W

Operating Environment

Temperature	-5 ... +45 °C (+23 ... +113 °F)
Humidity	0 ... 85 %RH, non-condensing
Flow velocity (GMD20)	0 ... 10 m/s
Electromagnetic compatibility	EN61326-1, Generic Environment

Mechanics

Housing material	ABS plastic
Housing classification (GMD20 electronics housing)	IP65
Weight: GMD20 (D)	140 g (170 g)

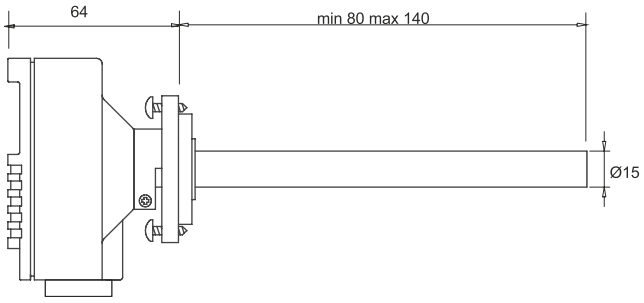
Accessories and Options

Display and relay option for GMD20	GMI21
Relay output option	GMR20
LonWorks® module with CO_2 signal	GML20
(Not available when display option is added)	
Serial COM adapter	19040GM
Hand-held meter for field verification	GM70

Dimensions

Dimensions in mm

GMD20 and GMD20D



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GMW115 Carbon Dioxide Transmitter for Demand Controlled Ventilation

The Vaisala CARBOCAP® Carbon Dioxide Transmitter GMW115 is a wall-mounted CO_2 transmitter for demand controlled ventilation.

Features/Benefits

- Compact, wall-mounted transmitter for demand controlled ventilation
- Incorporates Vaisala CARBOCAP®, the silicon based NDIR sensor with unique internal referencing
- Advanced, single-beam, dual wavelength measurement with no moving parts
- Excellent long-term stability
- Ideal for ventilation control in all types of occupied spaces

The wall-mounted Vaisala CARBOCAP® Carbon Dioxide Transmitter GMW115 is a compact transmitter for measuring room carbon dioxide levels in building automation applications.

Room carbon dioxide level is an indicator for indoor air quality and human presence. It can be used to steer ventilation to introduce an adequate (but not excess) air flow based on the true need for fresh air. Demand controlled ventilation is well suited to buildings and premises where occupancy varies. Examples of such facilities are schools, offices, meeting rooms, auditoriums, and sports arenas.

The GMW115 transmitter is designed for indoor use in various demand controlled applications. The transmitter is easy to install and needs practically no maintenance. There are two optional ranges of 0…2 000 ppm and 0…5 000 ppm to select from.

Proven Performance with the Vaisala CARBOCAP® Sensor

The GMW115 transmitter uses Vaisala CARBOCAP® carbon dioxide sensor, a silicon-based infrared (IR) absorption sensor. The excellent long-term stability of the CARBOCAP® sensor results from its unique measurement technology. The sensor features an electrically tunable Fabry-Perot Interferometer for built-in reference measurement. The sensor not only measures CO_2 absorption but also a reference, which makes it possible to compensate for potential light intensity variations and contamination and dirt accumulation in the optical path, making the sensor extremely stable over time.

CARBOCAP sensor has no need for any compensation algorithms that are used in more simple sensors to compensate for their drift. In buildings with around-the-clock occupancy (e.g. hospitals, manufacturing facilities, residential buildings, and retirement homes) the compensations based on assumed background carbon dioxide level simply do not work.

Technical Data

Performance

CO_2-measurement range	0 ... 2000 ppm 0.....5000 ppm
Accuracy (including repeatability, non-linearity and calibration uncertainty)	±(2 % of range + 2 % of reading)
Long-term stability	± 5 % of range/5 years
Response time T90	1 min
Temperature dependence, typical	-0,35 % of reading / °C
Pressure dependence, typical	+0,15 % of reading/hPa
Warm-up time	1 min, 10 min for full. specification
Product lifetime	> 10 years

Operating Environment

Temperature	-5 ... +45 °C (23 ... 113 °F)
Humidity	0 ... 85 %RH
Pressure	700 ... 1200 hPa
Electromagnectic compatibility	
Complies with EMS standard EN61326-1, Generic Environment	

Inputs and Outputs

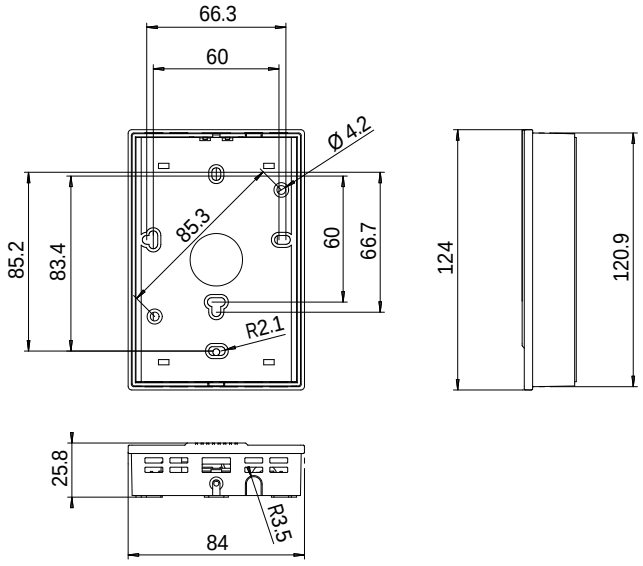
Operating voltage	24 V (±20 %) AC/DC
Power consumption	<2 W
Outputs	4 … 20 mA, 0 … 10 V, RS-485, 2-wire, non-isolated

Housing

Material:	ABS plastics
Colour:	Cycolac 233599/NCS 0502-G50Y
Fire resistance:	UL94 HB
Ingress protection:	IP30

Dimensions

Dimensions in mm



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GMW116 Carbon Dioxide and Temperature Transmitter for Ventilation Control

The Vaisala CARBOCAP® Carbon Dioxide and Temperature Transmitter GMW116.

Features/Benefits

- Compact dual-parameter transmitter: measures both CO_2 and T
- Incorporates Vaisala CARBOCAP®, the silicon based NDIR sensor with unique internal referencing
- Advanced, single-beam, dual wavelength measurement with no moving parts
- Excellent long-term stability
- Ideal for ventilation control in all types of occupied spaces including those with around-the-clock occupancy
- No need for temperature compensation

The Vaisala CARBOCAP® Carbon Dioxide and Temperature Transmitter GMW116 is the compact-size transmitter that measures both carbon dioxide and temperature. The sensor is accurate and durable and it has an excellent long-term stability, which decreases maintenance.

The excellent performance of the Vaisala CARBOCAP® sensors results largely from the stable reference provided by the electrically tunable Fabry-Perot Interferometer (FPI).

In buildings with around-the-clock occupancy (e.g. hospitals, work-places, residential buildings, retirement homes), the assumed background CO_2 level reference is simply not applicable. The true internal reference measurement of Vaisala CARBOCAP® CO_2 transmitters provides years of stable CO_2 measurements.

The GMW116 Transmitter is designed especially for demand controlled ventilation applications with CO_2 measurement range of 0 … 2000 ppm and temperature range of 0 ... +50 °C.

With GMW116 there is no need for temperature compensation. The ideal gas temperature behaviour is taken into account automatically.

Technical data

Performance

CO_2-measurement range	0 ... 2000 ppm
Temperature measurement range	0 ... +50 °C
Accuracy (including repeatability, non-linearity and calibration uncertainty)	± (2 % of range + 2 % of reading
Long-term stability	± 5 % of range/5 years
Response time T90	1 min
Temperature dependence	compensated
Pressure dependence, typical	+0.15 % of reading/hPa
Temperature measurement accuracy	± 0.7 °C at 25 °
Warm-up time	1 min, 10 min for full. specification
Product lifetime	> 10 years

Operating environment

Temperature	0 ... +50 °C
Humidity	0 ... 85 % RH
Pressure	700 ... 1200 hPa
Electromagnectic compatibility	
Complies with EMS standard EN61326-1, Generic Environment	

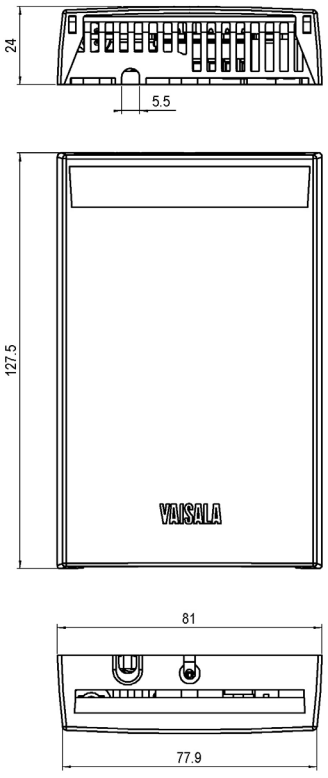
Inputs and outputs

Operating voltage	24 V (±20 %) AC/DC
Power consumption	<2 W
Outputs	0 … 10 V

Housing

Material	ABS/PC blend plastics
Weight	120 g
Cover and base colour	white RAL 9003
Fire resistance	UL94 V0
Ingress protection	IP30

Dimensions



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GMW90 Series Carbon Dioxide, Temperature, and Humidity Transmitters for Demand Controlled Ventilation Applications

GMW90 Series Carbon Dioxide, Temperature and Humidity Transmitters for HVAC are available with either a display opening or a solid front. An optional traffic light indication can also be selected.

Features/Benefits

- Measured parameters: carbon dioxide, temperature, and humidity (optional)
- Superior long-term stability with the next generation Vaisala CARBOCAP® sensor
- Accurate temperature and humidity measurements in a three-parameter instrument due to the low-power microglow infrared source
- Quick and easy installation and maintenance
- Calibrated, user-exchangeable modules for carbon dioxide, temperature and humidity
- 3-point traceable CO_2 calibration (certification included)
- Both analog and digital communication (BACnet/Modbus)

The Vaisala GMW90 Series CARBOCAP® Carbon Dioxide, Temperature, and Humidity Transmitters are based on new measurement technology for improved reliability and stability. With the new technology the transmitter's inspection interval is extended to five years.

Designed for demand controlled ventilation, these transmitters measure carbon dioxide and temperature, with the option for humidity measurements. The instruments come with a calibration certificate that meets traceability and compliance requirements.

Reliability from Unique Measurement Technology

The GMW90 Series Transmitters use advanced Micro-Electro-Mechanical System (MEMS) technology for measuring carbon dioxide. The CARBOCAP® carbon dioxide sensor's continuous reference measurement enables reliable and accurate readings and outstanding long-term stability also in buildings with round-the-clock occupancy.

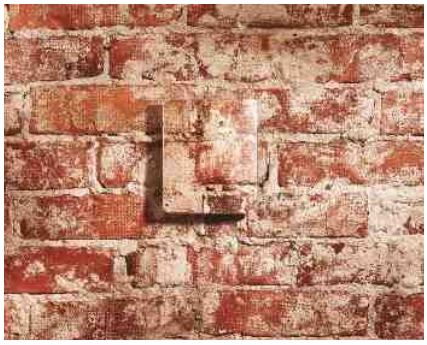
The new generation CARBOCAP® sensor no longer uses an incandescent light bulb, which limits sensor lifetime. This unique sensor consumes very little power compared to other sensors on the market. As a result, instrument self-heating is low and humidity and temperature can be measured correctly.

Convenient Installation

GMW90 Series Transmitters have been designed for quick and easy installation and maintenance. Every model includes a display for easy startup and convenient maintenance. To protect the sensor from dust and dirt during construction and installation, the units can be cabled with back-plate only. Electronics can be snapped on later at an appropriate phase in the construction project. Dip switches make it quick and easy to configure the transmitters.

Easy Calibration

Regular instrument maintenance guarantees a long product lifetime. Calibration is easiest done with the exchangeable measurement modules. Sensor traceability and measurement quality is easily maintained by snapping on a new module calibrated at Vaisala factory. The instrument can also be calibrated using a hand-held meter or reference gas CO_2bottle. The service interfaces are easy to reach by simply sliding the cover down. The closed cover keeps the measurement environment stable during calibration and ensures a top-quality final result.



Make the transmitter blend into your interior design with the optional decorative cover.

Technical Data

Models

GMW93	CO_2+T	3-wire, voltage output
GMW93D	CO_2+T	3-wire, voltage output with display
GMW94	CO_2+T	3-wire, current output
GMW94D	CO_2+T	3-wire, current output with display
GMW93R	CO_2+T+RH	3-wire, voltage output
GMW93RD	CO_2+T+RH	3-wire, voltage output with display
GMW93RA	CO_2+T+RH	3-wire, voltage output with display and CO_2 indicator LEDs
GMW94R	CO_2+T+RH	3-wire, current output
GMW94RD	CO_2+T+RH	3-wire, current output with display
GMW95	CO_2+T	Digital (BACnet/Modbus) model
GMW95D	CO_2+T	Digital (BACnet/Modbus) model with display
GMW95R	CO_2+T+RH	Digital (BACnet/Modbus) model
GMW95RD	CO_2+T+RH	Digital (BACnet/Modbus) model with display
GMW90	CO_2+T	Configurable analog/digital models
GMW90R	CO_2+T+RH	Configurable analog/digital models

Performance

CARBON DIOXIDE	
Measurement range	0 … 5000 ppm
Accuracy	
+20 ... +30 °C (+ 68 ... + 86 °F)	± (30 ppm + 2 % of reading)
+10 ... +20 °C, +30 ... +40 °C (+50 ... +68 °F, +86 ... +104 °F)	± (35 ppm + 2.7 % of reading)
-5 ... +10 °C, +40 ... +55 °C (+23 ... +50 °F, +104 ... +131 °F)	± (45 ppm + 3.8 % of reading)
Stability in typical HVAC applications	Total accuracy at room temperature ±75 ppm at 600 and 1000 ppm incl. 5 years drift*
Carbon dioxide sensor	Vaisala CARBOCAP® GM10
TEMPERATURE	
Measurement range	-5 ... +55 °C (+23 ... +131 °F)
Accuracy	
+20 ... +30 °C (+68 ... +86 °F)	±0.5 °C (± 0.9 °F)
+10 ... +20 °C, +30 ... +40 °C (+50 ... +68 °F, +86 ... +104 °F)	±0.6 °C (± 1.08 °F)
-5 ... +10 °C, +40...+55 °C (+23 ... +50 °F, +104 ... +131 °F)	±0.8 °C (± 1.44 °F)
Temperature sensor	Digital temperature sensor
RELATIVE HUMIDITY	
Measurement range	0 ... 95 %RH
Accuracy	
Temperature range	+10 ... +40 °C (+50 ... +104 °F)
0 ... 60 %RH	±2.5 %RH
60 … 80 %RH	±3.0 %RH
80 ... 95 %RH	±4.0 %RH
Temperature range	-5 ... +10 °C, +40 ... + 55 °C (+23 ... +50 °F, +104 ... +131 °F)
0 ... 60 %RH	±3.5 %RH
60 … 80 %RH	±4.0 %RH
80 ... 95 %RH	±5.0 %RH
Stability in typical HVAC applications	±0.5 %RH/year
Humidity sensor	Vaisala HUMICAP® 180R

*Complies with CEC-400-2008-001-CMF

Operating Environment

Operating temperature range	-5 ... +55 °C (+23 ... +131 °F)
Operating humidity range	0 … 95 %RH Dewpoint <30 °C (+86 °F)
Storage temperature range	-30 ... +60 °C (-22 ... +140 °F)
Electromagnetic compliance	EN61326-1, Industrial Environment

Spare Parts and Accessories

CO_2 module	GM10SP
Temperature Module (CO_2+T models)	TM10SP
Humidity and Temperature Module (CO_2+T+RH models)	HTM10SP
Decorative cover set (10 pcs.)	236285
Connection cable for HM70 hand-held meter	219980
USB cable for PC connection	219690

Mechanics

IP class	IP30
Standard housing color	White (RAL9003*)
Housing material	ABS/PC, UL-V0 approved
Output connector	Screw terminals max. wire size 2 mm^2 (AWG14)
Service port connector	4-pin M8
Weight	163 g

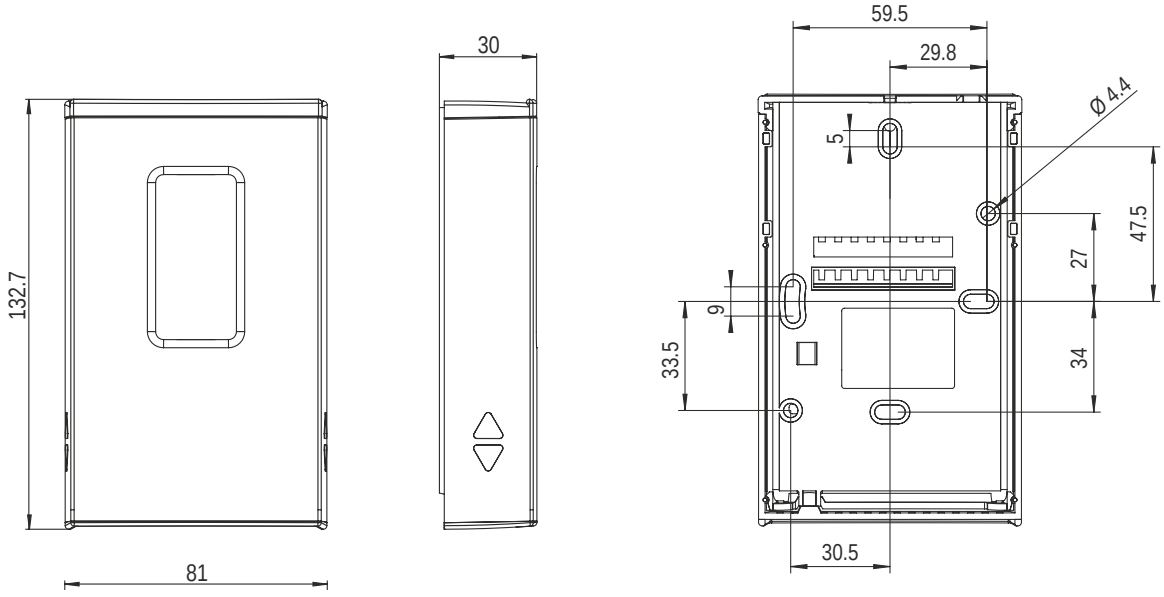
*RAL code is only indicative with potential small variations in color shade

Inputs and Outputs

Supply voltage	18 … 35 VDC, 24 VAC ± 20% 50/60 Hz
Current output models	
Outputs	0/4…20 mA, 2 and 3 channel models available
Loop resistance	0…600 Ω
Power consumption	<2W
Voltage output models	
Outputs	0…5/10 V, 2 and 3 channel models available
Load resistance	10 kΩ min.
Power consumption	<1W
Digital models	
Power consumption	<1.5W
Output type	RS-485 (galvanic isolation, 1.5 kV)
RS-485 end of line termination	Enable with jumper, 120 Ω
Supported protocols	Selectable by DIP switch
BACnet MS/TP	
Operating mode	Selectable Master/Slave
Address range, master mode	0 … 127
Address range, slave mode	128…255
Modbus RTU	
Address range	0 … 247
Service port	RS-485 line for temporary service use

Dimensions

Dimensions in mm



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HMDW110 Series Humidity and Temperature Transmitters for High-Accuracy Measurements in HVAC Applications

HMDW110 Series Humidity and Temperature Transmitters for measurements in ducts, outdoor environments, and humid areas.

Vaisala HUMICAP® Humidity and Temperature Transmitter Series HMDW110 measure relative humidity and temperature in multiple HVAC applications. The series includes transmitters for duct mounting, IP65-classified wall transmitters, and outdoor transmitters with integrated radiation shields.

Proven Vaisala HUMICAP® Performance

The cost-efficient HMDW110 series transmitters are equipped with trusted HUMICAP® 180R sensors. The sensor's superior long-term stability minimizes maintenance needs throughout the transmitter's lifetime. If necessary, the transmitter can be field-calibrated using either an HM70 Hand-Held Humidity and Temperature Meter, or a PC connection.

HMDW110 series instruments are individually adjusted and delivered with a calibration certificate. The factory calibration is traceable to NIST.

Unrivaled Outdoor Humidity Measurements

The integrated radiation shield of the outdoor models HMS110 and HMS112 enables unrivaled measurement performance. It reduces the impact of sunshine on temperature and humidity measurements, and ensures measurement accuracy in outdoor conditions. The most popular control parameters in free cooling – dew point temperature, wet bulb temperature, and enthalpy – are available as output parameters.

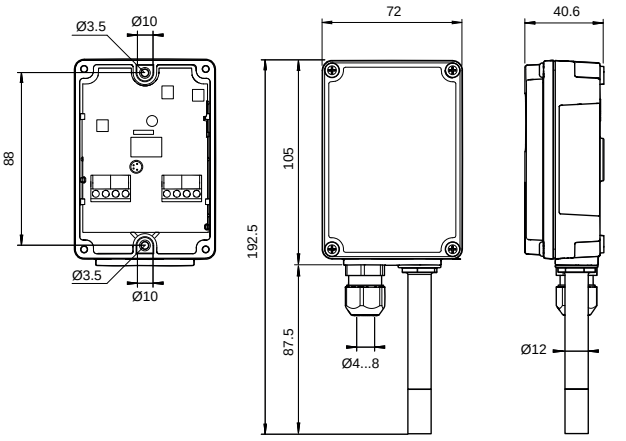
Features/Benefits

- Accurate humidity and temperature transmitters for measurements in HVAC and cleanroom applications
- Outdoor transmitter with professional-grade radiation shield
- Proven HUMICAP® 180R sensor for superior long-term stability
- ±2 %RH accuracy
- 3-point NIST traceable calibration (certificate included)
- On-site calibration with HM70 Hand-Held Meter or PC connection
- Current output (4 ... 20 mA)
- Default output parameters are relative humidity and temperature. Dew point temperature, wet bulb temperature, and enthalpy outputs selectable with a PC connection.

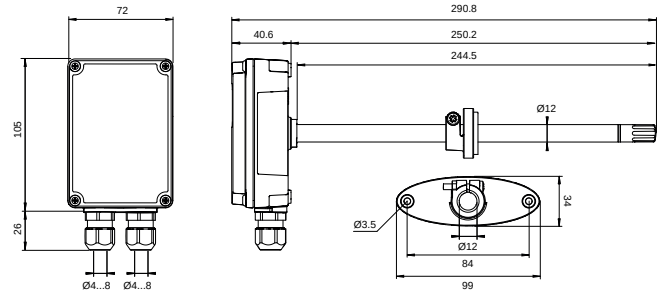
Well-Suited for Cleanroom Monitoring

The HMD110 and HMW110 transmitters can be ordered with a catalytic HUMICAP® sensor HUMICAP® 180VHP. The catalytic sensor improves stability especially in hydrogen peroxide sterilized environments where repeated condensation is expected.

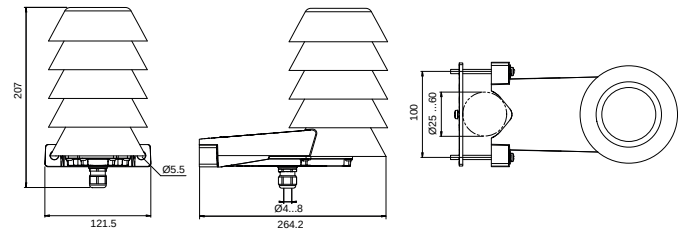
An optional panel display can be added for remote monitoring. Transmitters can be installed into difficult-to-reach locations, while measurement data can be read from a more convenient spot.



HMW110/112
RH+T transmitters for measurements in wet areas



HMD110/112
RH+T transmitters for ducts



HMS110/112
RH+T transmitters for outdoor measurements

Technical Data

Models

Model number	Type	Output	Special Features	Ingress Protection
HMW110	Wall-mount, RH+T	2-wire, current output	Configurable model*	IP65
HMW112	Wall-mount, RH+T	2-wire, current output		IP65
HMD110	Duct-mount, RH+T	2-wire, current output	Configurable model*	IP65
HMD112	Duct-mount, RH+T	2-wire, current output		IP65
HMS110	Outdoor, RH+T	2-wire, current output	Radiation shield, configurable model*	IP65
HMS112	Outdoor, RH+T	2-wire, current output	Radiation shield	IP65

*Delivered with customer specific output settings, including calculated humidity parameters and special scaling of outputs.

Performance

RELATIVE HUMIDITY	
Measurement range	0 ... 100 %RH
Accuracy	
Temperature range	+10 ... +30 °C (+50 ... +86 °F)
0 ... 90 %RH	±2 %RH
90 ... 100 %RH	±3 %RH
Temperature range	-20 ... +10 °C, +30 ... +60 °C (-4 ... +50 °F, +86 ... +140 °F)
0 … 90 %RH	±3 %RH
90 … 100 %RH	±4 %RH
Temperature range	-40 ... -20 °C (-40 ... -4 °F)
0 ... 100%RH	±4 %RH
Stability in typical HVAC applications	±0.5 %RH/year
Humidity sensor	Vaisala HUMICAP® 180R
TEMPERATURE	
Measurement range	-40 ... +60 °C (-40 ... +140 °F)
Accuracy	
At +20 °C (+68 °F)	±0.3 °C
Temperature dependence	±0.01 °C/°C
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751
CALCULATED PARAMETERS	
Measurement range for dew point temperature and wet bulb temperature	-40 ... +60 °C (-40 ... +140 °F)
Measurement range for enthalpy	-40 ... 460 kJ/kg (-10 ... +190 BTU/lb)
Accuracy of the calculated parameters should be calculated at the actual condition based on the RH and temperature specification.	
Accuracy at 20°C (68°F) and 80%RH:	
Dew point	±0.7 °C (1.2 °F)
Wet bulb temperature	±0.5 °C (0.9 °F)
Enthalpy	±1.6kJ/kg (0.7 BTU/lb)

Operating Environment (All Models)

Operating temperature range	-40 ... +60 °C (-40 ... +140 °F)
Operating humidity range	0 ... 100 %RH
Maximum wind/flow speed	30 m/s
Storage temperature	-40 ... +60 °C (-40 ... +140 °F)
Electromagnetic compliance	EN61326-1, Industrial Environment

Mechanics

Max wire size	1.5 mm^2 (AWG 16)
Standard housing color	White (RAL9003)
Housing material	PC + 10%GF (UL-V0 approved)

Inputs and Outputs

Analog output	4 ... 20 mA, loop powered
Loop resistance	0 ... 600 Ω
Supply voltage	20 ... 28VDC at 600 Ω load 10 ... 28VDC at 0 Ω load
Data input for RDP100 Remote Panel Display	RS485, Vaisala proprietary protocol

Spare Parts and Accessories

Remote Panel Display	RDP100
Conduit fitting + O-ring (M16x1.5 / NPT1/2 Inch)	210675SP
Conduit fitting + O-ring (M16x1.5 / PG9, RE-MS)	210674SP
Fastening set HMS110	237805
Porous PTFE Filter	DRW239993SP
Membrane Filter	ASM210856SP
Terminal Block, Blue	236620SP
USB cable for PC connection	219690
Connection cable for HM70 hand-held meter	219980SP
HUMICAP® 180R sensor	HUMICAP180R
Catalytic HUMICAP® sensor	HUMICAP180VHP

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HMD60/70 Humidity and Temperature Transmitters for ducts in HVAC applications

Vaisala HUMICAP® Humidity and Temperature Transmitters HMD60 and HMD70 are designed for use in air conditioning applications where accurate and stable control of relative humidity and temperature are required.

Features/Benefits

- Full 0 ... 100 %RH measurement
- Accuracy up to ±2 %RH
- True two-wire transmitters with 4 ... 20 mA loop powered output (HMD60)
- Selectable signal output of 0 ... 1 V, 0 ... 5 V or 0 ... 10 V (HMD70) with optional current module also 0 ... 20 mA (HMD70)
- Vaisala HUMICAP® Sensor for excellent accuracy and long-term stability, negligible hysteresis and resistance to dust and most chemicals.
- Temperature compensated
- IP65 (NEMA 4) housing
- Also available as temperature-only transmitters HMD 60T/70T
- NIST traceable (certificate included)

The duct mounted Vaisala HUMICAP® Humidity and Temperature Transmitters HMD60 and HMD70 are designed for monitoring relative humidity and temperature in building energy management systems. The combination of high accuracy, stability and reliable operation, make these products the ideal choice for demanding applications.

Resistant to chemicals and dust

The duct mount HMD60 and HMD70 transmitters can also be used in many industrial humidity monitoring applications, where their stability and resistance to chemicals and dust are of great value. A useful feature of these duct mount transmitters is the ability to remove the electronics without removing the unit from the duct.

Measures both humidity and temperature

The HMD60 and HMD70 transmitters are available in three models: U for humidity measurement-only, Y for humidity and temperature measurement, and T for temperature only.

Fast, on-site calibration

The accuracy of the transmitters is simple to check using either the Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM70 or the Vaisala HUMICAP® Humidity Indicator HMI41. The calibration can be done in seconds with a single potentiometer without disturbing the operation, resulting in great savings both in maintenance time and costs.

Technical data

60 series: 2-wire, 4 to 20 mA output

Duct mount	RH only	HMD60U
	RH & T	HMD60Y
	T only	HMD60T

70 series: 3-wire, variable voltage output

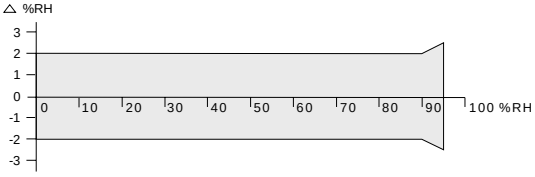
Duct mount	RH only	HMD70U
	RH & T	HMD70Y
	T only	HMD70T

Relative humidity

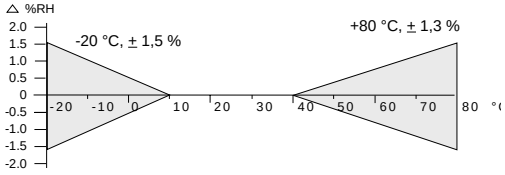
Measurement range

duct mount 0 ... 100 %RH*

Accuracy at +20 °C



Temperature dependence

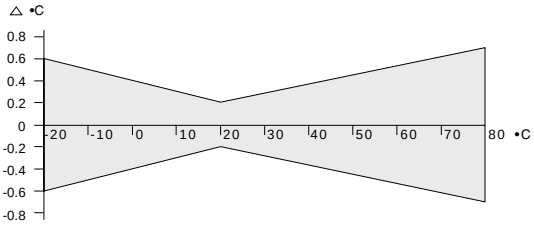


Response time at +20 °C (+68 °F),	
90% response	15 s (with membrane filter)
Stability	± 2 %RH / 2 years
Sensor	HUMICAP® 180

Temperature (Y and T models)

Linearity	better than 0.1 °C
Sensor	Pt 1000 IEC 751 class B
Measurement range	-20 ...+80 °C (-4 ... 176 °F) **

Accuracy



** Optional temperature scales are available on request.

General - 60 series

Supply voltage	10 ... 35 VDC (RL = 0 ohm)
	20 ... 35 VDC (RL = 500 ohm)
Output signal	4 ... 20 mA

General - 70 series

Supply voltage range depends on the selected output signal

	DC	AC
0 ... 1 V	10 ... 35 V	9 ... 24 V
0 ... 5 V	14 ... 35 V	12 ... 24 V
0 ... 10 V	19 ... 35 V	16 ... 24 V
WITH OPTIONAL CURRENT MODULE		
0 ... 20 mA (RL = 0 ohm)	10 ... 35 V	11 ... 24 V
**0 ... 20 mA (RL = 500 ohm)	20 ... 35 V	17 ... 24 V

Power consumption @ 24 VAC	
HMD70U	10 mA typical
HMD70Y	12 mA typical

General

Operating temperature range	
electronics	-5 ... +55 °C (+23 ... +131 °F)
probe	-20 ... +80 °C (-4 ... +176 °F)
Storage temperature range	-40 ... +80 °C (-40 ... +176 °F)
Maximum flow speed	50 m/s
Current module	part no. 18945 HM
Housing	
probe	stainless steel
electronics	cast aluminum
Connections	screw terminals 0.5 ... 1.5 mm^2
Sensor protection	
standard	membrane filter (part no. DRW010525)
optional	stainless steel sintered filter (part no. HM46670SP)
Cable thread-through	
bushing for 7 ... 10 mm (PG9)	
cable housing IP65 (NEMA 4)	part no. 18941HM
armoured cable glands (must be ordered separately)	part no. 10528HM

Complies with EMC standard EN61326 and EN55022

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HMD/W60/70 Humidity and Temperature Transmitters for HVAC Applications

Vaisala HUMICAP® Humidity and Temperature Transmitters HMD/W60 and HMD/W70 are designed for use in air conditioning applications where accurate and stable control of relative humidity and temperature are required.

Features/Benefits

- Full 0...100 %RH measurement
- Accuracy up to ±2 %RH
- True two-wire transmitters with 4...20 mA loop powered output (HMD60 and HMW60)
- Selectable signal output of 0...1 V, 0...5 V or 0...10 V (HMD70 and HMW70) with optional current module also 0...20 mA (HMD70)
- Vaisala HUMICAP® Sensor for excellent accuracy and long-term stability, negligible hysteresis and resistance to dust and most chemicals.
- Temperature compensated
- IP65 (NEMA 4) housing (duct unit only)
- Also available as temperature-only transmitters HMD/W 60T/70T
- NIST traceable (certificate included)
- Compatible with Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM70

The duct and wall-mounted Vaisala HUMICAP® Humidity and Temperature Transmitters HMD/W60 and HMD/W70 are designed for monitoring relative humidity and temperature in building energy management systems. The combination of high accuracy, stability and reliable operation, make these products the ideal choice for demanding applications.

Resistant to chemicals and dust

The duct mount HMD60 and HMD70 transmitters can also be used in many industrial humidity monitoring applications, where their stability and resistance to chemicals and dust are of great value. A novel feature of these duct mount transmitters is the ability to remove the electronics without removing the unit from the duct.

Measures both humidity and temperature

The HMD/W60 and HMD/W70 transmitters are available in three models: U for humidity measurement-only, Y for humidity and temperature measurement, and T for temperature only.

Fast, on-site calibration

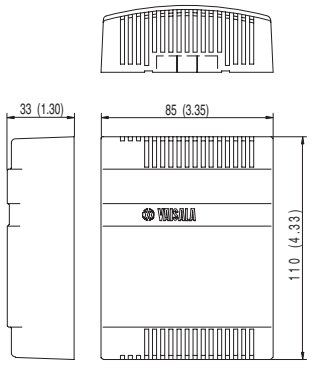
The accuracy of the transmitters is simple to check using either the Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM70 or the Vaisala HUMICAP® Humidity Indicator HMI41. The calibration can be done in seconds with a single potentiometer without disturbing the operation, resulting in great savings both in maintenance time and costs.

Customized calibration and maintenance contracts are available on request.

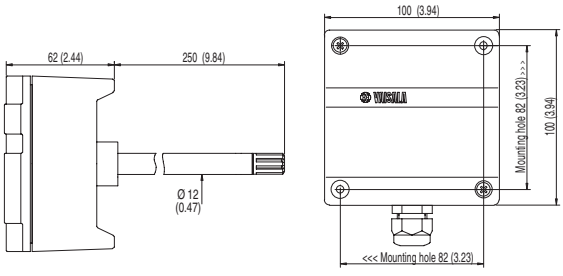
Dimensions

Dimensions in mm (inches).

HMW60/70



HMD60/70



Technical Data

60 series: 2-wire, 4 to 20 mA output

Wall mount	RH only	HMW60U
	RH & T	HMW60Y
Duct mount	RH only	HMD60U
	RH&T	HMD60Y

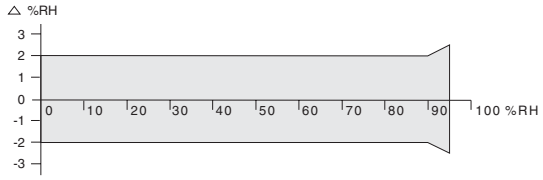
70 series: 3-wire, variable voltage output

Wall mount	RH only	HMW70U
	RH & T	HMW70Y
Duct mount	RH only	HMD70U
	RH & T	HMD70Y

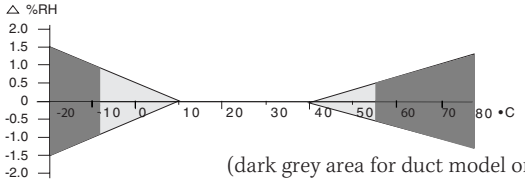
Relative humidity

Measurement range
- duct mount: 0...100 %RH*
- wall mount: 0...95 %RH*

Accuracy at +20 °C



Temperature dependence



(dark grey area for duct model only)

Response time at +20 °C (+68 °F), 90% response: 15 s (with membrane filter)

Sensor: HUMICAP® 180

* Output signal corresponds to 0...100 %RH

Temperature (Y-models only)

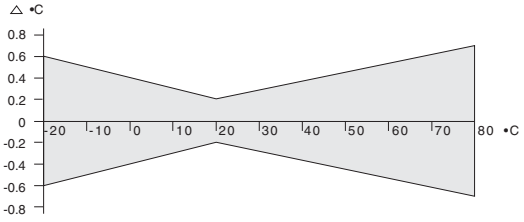
Linearity: better than 0.1 °C

Sensor: Pt 1000 IEC 751 class B

HMD60Y and HMD70Y

Measurement range: -20...+80 °C (-4...176 °F) **

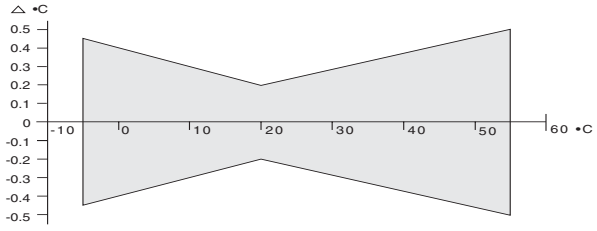
Accuracy



HMW60Y and HMW70Y

Measurement range: -5...+55 °C (+23...131 °F) **

Accuracy'



** Optional temperature scales are avaialble on request.

General - 60 series

Supply voltage	10...35 VDC (RL = 0 ohm)
	20...35 VDC (RL = 500 ohm)
Output signal	4...20 mA

General - 70 series

Supply voltage range depends on the selected output signal

	DC	AC
0...1V	10...35 V	9...24 V
0...5 V	14...35 V	12...24 V
0...10 V	19...35 V	16...24 V
**0...20 mA (RL = 0 ohm)	10...35 V	11...24 V
**0...20 mA (RL = 500 ohm)	20...35 V	17...24 V

** HMD models only.

Power consumption @ 24 VAC
- HMD/W70U: 10 mA typical
- HMD/W70Y: 12 mA typical

General

Operating temperature range	
electronics	-5...+55 °C (+23...+131 °F)
sensor head (duct mount)	-20..+80 °C (-4...+176 °F)
Storage temperature range	-40...+80 °C (-40...+176 °F)
Long-term humidity range for electronics (wall mount)	0...85 %RH
Housing	
sensor head (duct mount)	stainless steel
electronics (duct mount)	cast aluminum
electronics (wall mount)	ABS plastic
Connections	screw terminals 0.5...1.5 mm^2
Sensor protection (duct mount)	
standard	membrane filter (part no. DRW010525)
option	stainless steel sintered filter (part no. HM46670)

For duct mount units:

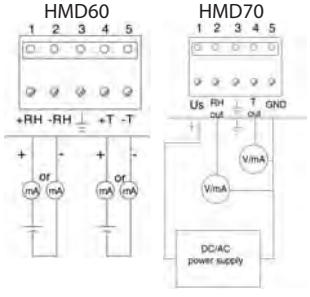
Cable thread-through
- bushing for 7...10 mm (PG9)
- cable housing IP65 (NEMA 4): part no. 18941HM
- or
- armoured cable glands (must be ordered separately): part no. 10528HM

For field check: HM70 hand-held humidity and temperature meter or HMI41 humidity indicator

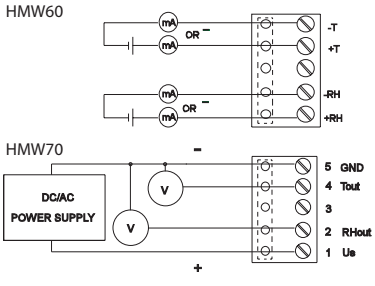
Complies with EMC standard EN61326-1:1997 + Am1:1998 + Am2:2001; Generic Environment.

Wiring

HMD60/70 wiring diagram



HMW60/70 wiring diagram



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HMD60UO/YO Outdoor Humidity and Temperature Transmitter & Solar Radiation Shield

Vaisala HUMICAP® Humidity and Temperature Trasnmitter HMD60YO, combined with Vaisala Solar Radiation Shield DTR503B is easy to install and ideal for outdoor applications.

Features/Benefits

- Full 0...100 %RH measurement
- Vaisala Solar Radiation Shield DTR503B provides excellent ventilation while blocking direct and reflected solar radiation, and precipitation
- True two-wire transmitter with 4 to 20 mA loop powered output: compatible with most energy management systems
- Electromagnetically compatible
- Temperature compensated
- Excellent long-term stability
- Negligible temperature coefficient
- ±2% accuracy (0...90 %RH), ±3% (90%...100 %RH)
- NEMA 4 (IP65) housing

Stable performance in demanding outside environments

The duct-mount Vaisala HUMICAP® Humidity and Temperature Transmitters HMD60UO and HMD60YO utilize Vaisala HUMICAP® Sensor. The Vaisala HUMICAP® Sensor is known for its excellent reliability, long-term stability, and reliable operation in humidity measurement. In addition, the sensors are insensitive to dust and most chemicals, and are not damaged by condensation. The transmitters feature two wire connections that make retrofitting, upgrading and installations easy.

Fast, on-site calibration

The accuracy of the transmitters is easy to check by using Vaisala HUMICAP® Hand-Held Humidity Meter HM70. The calibration can be done in seconds with a single potentiometer – without disturbing the operation, thus ensuring accuracy and saving hours of maintenance time.

Shield protects sensor

The maintenance-free, 12 plate Vaisala Solar radiation Shield DTR503B is naturally ventilated, and protects the sensors from scattered, as well as, direct solar radiation and rain.

The plates are composed of a special plastic material that offers excellent thermal characteristics and UV stabilized construction. The white outer surface reflects radiation, while the black inside absorbs accumulated heat, resulting in more accurate measurement.

Easy-to-install

The easy-to-install DTR503B is suitable for a wide range of applications. It can be mounted on a vertical pole, horizontal beam or flat surface.

HMD70UO/YO

Versatile alternatives to the HMD60UO/YO transmitters for outdoor applications are the HMD70UO/YO transmitters. These instruments feature selectable output signals of 0...1V, 0...5V, or 0...10V or 0...20mA. Powered by either AC or DC voltage, they are available with relative humidity only, or relative humidity and temperature sensors. They are also equipped with the radiation/precipitation shield.

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Technical Data

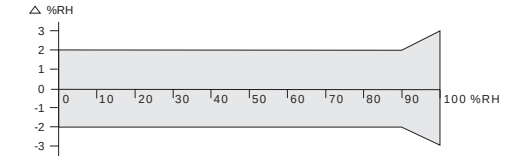
General

Supply voltage	10...35 VDC (R_L = 0 ohms) 20...35 VDC (R_L = 500 ohms)
Output signal	4...20 mA
Operating temperature range:	
electronics	-40... +60 °C (-40...+140 °F)
sensor head	-40...+60 °C (-40 ...+140 °F)
Storage temperature range	-40...+80 °C (-40...+176 °F)
Connections	screw terminals 0.5...1.5 mm²
Housing:	
sensor head	stainless steel
electronics housing	cast aluminum
Sensor protection	membrane filter
optional	stainless steel sintered filter

Relative humidity

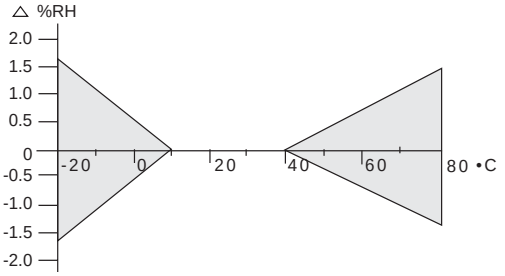
HMD60U and HMD60Y

Measurement range	0...100 %RH
Accuracy at +20 °C (+68 °F)	



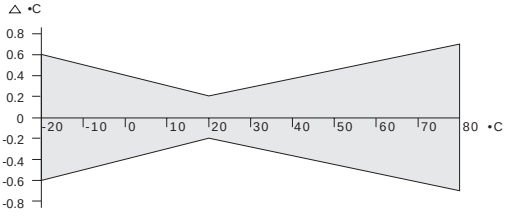
Temperature dependence

Response time at +20 °C (+68 °F)	15 s with membrane filter
Sensor HUMICAP® 180	



Temperature (Y and T models only)

Measurement range	-20...+60 °C (-4...+140 °F)
Output signal	-40...+60 °C (-40...+140 °F)



Accuracy	
Linearity	better than 0.1 °C (0.18 °F)
Sensor PT 1000 IEC 751 class B	

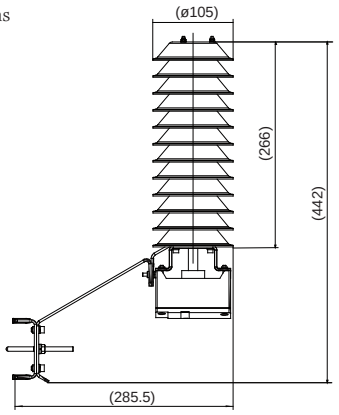
PRICE:

2-Wire:	Output signals	
HMD60UO	RH only	$610
HMD60YO	RH & Temp.	$720
3-Wire:		
HMD70UO	RH only	$640
HMD70YO	RH & Temp.	$800

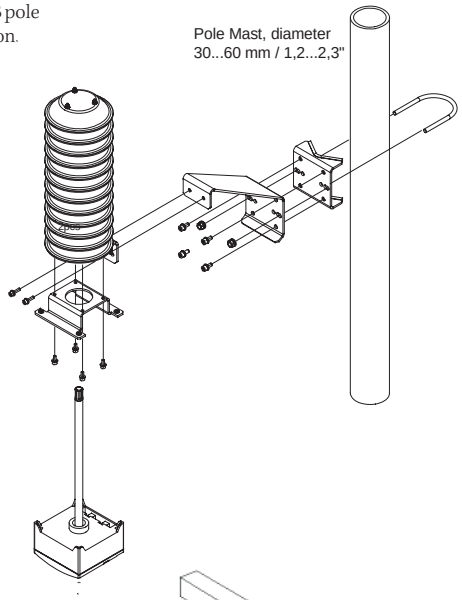
Dimensions

Dimensions in mm

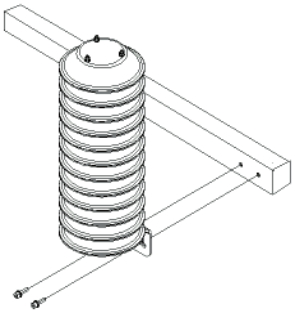
DTR503B dimensions



DTR503B pole installation.



DTR503B horizontal beam installation.



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HMDW80 Series Humidity and Temperature Transmitters for Building Automation Applications

HMDW80 Series Humidity and Temperature Transmitters for multiple applications within building automation.

Features/Benefits

- Reliable transmitters for basic HVAC humidity measurements
- ±3.0 %RH accuracy
- Full 0 ... 100 %RH measurement range
- Optimized for easy installation and low maintenance
- User exchangeable INTERCAP® sensor for easy field replacement
- Output parameters: relative humidity and temperature with optional dew point temperature, wet bulb temperature and enthalpy parameters
- UL- V0 flammability rating

Typical Installation Locations

- Ventilation ducts
- Walls
- Wash-down areas
- Outdoor locations

Vaisala INTERCAP® Humidity and Temperature Transmitter Series HMDW80 measure relative humidity and temperature in various building automation applications. Transmitters combine easy installation and reliable operation with a low requirement for maintenance.

The versatile HMDW80 series includes transmitters for wall and duct mounting, IP65-classified transmitters for humid areas, and transmitters with a radiation shield for outdoor use. It also includes temperature-only transmitters and transmitters with an optional display.

Calculated humidity parameters – dew point temperature, wet bulb temperature, and enthalpy – are also available.

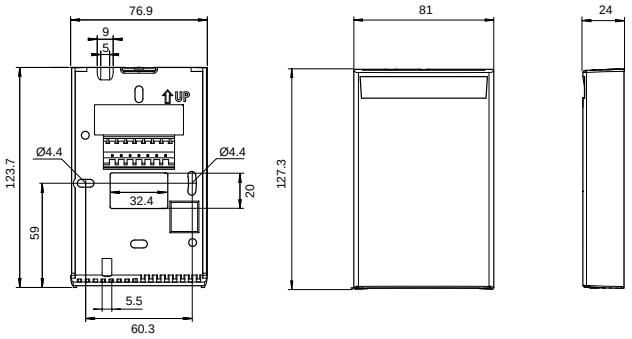
Easy Installation

HMDW80 series transmitters are optimized for easy installation. There are no loose parts, screws are retained in the enclosure, all connectors are clearly labeled, and the connectors are within easy reach.

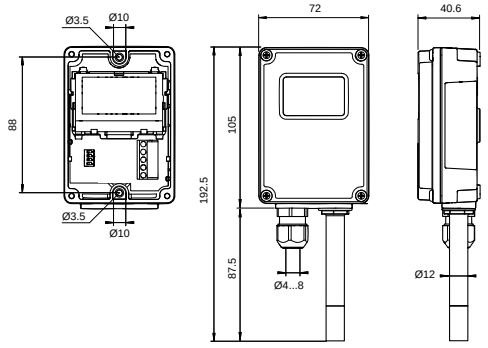
The duct mount transmitters are well suited to a variety of duct sizes, the outdoor transmitters can be mounted directly onto a wall or pole without any extra accessories, and the wall mount transmitters can be installed without the need to make holes in the transmitter enclosure.

Reliable Operation

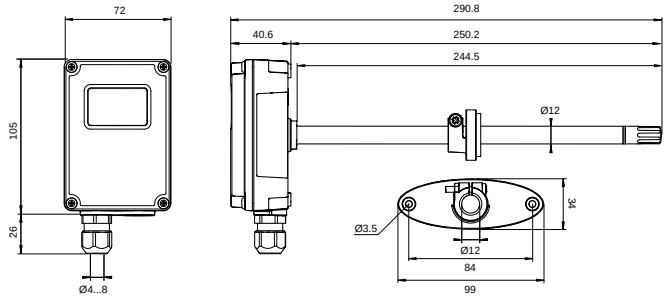
HMDW80 series transmitters require minimal maintenance thanks to their excellent sensor stability and high-quality materials. If necessary, the INTERCAP® sensor can be easily exchanged in the field with minimum downtime.



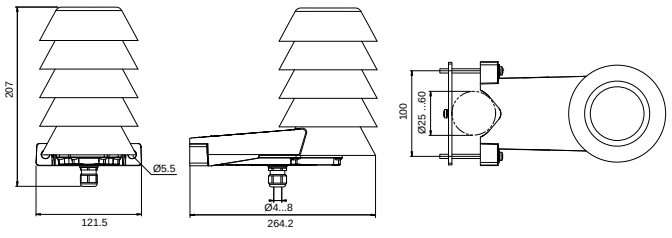
HMW82/83 RH+T and TMW82/83 T-only transmitters for wall-mounting



HMW88/89(D) RH+T transmitters for measurements in wet areas



HMD82/83(D) and TMD82/83 RH+T and T-only transmitters for ducts



HMS82/83 RH+T transmitters for outdoor measurements

Technical Data

Models

Model number	Type	Output	Special Features	Ingress Protection
TMW82	Wall-mount, T-only	2-wire, current output		IP30
TMW83	Wall-mount, T-only	3-wire, voltage output		IP30
HMW82	Wall-mount, RH+T	2-wire, current output		IP30
HMW83	Wall-mount, RH+T	3-wire, voltage output		IP30
HMW88	Wall-mount, RH+T	2-wire, current output	Calculated parameters*	IP65
HMW88D	Wall-mount, RH+T	2-wire, current output	Display, calculated parameters*	IP65
HMW89	Wall-mount, RH+T	3-wire, voltage output	Calculated parameters*	IP65
HMW89D	Wall-mount, RH+T	3-wire, voltage output	Display, calculated parameters*	IP65
TMD82	Duct-mount, T-only	2-wire, current output		IP65
TMD83	Duct-mount, T-only	3-wire, voltage output		IP65
HMD82	Duct-mount, RH+T	2-wire, current output	Calculated parameters*	IP65
HMD82D	Duct-mount, RH+T	2-wire, current output	Display, calculated parameters*	IP65
HMD83	Duct-mount, RH+T	3-wire, voltage output	Calculated parameters*	IP65
HMD83D	Duct-mount, RH+T	3-wire, voltage output	Display, calculated parameters*	IP65
HMS82	Outdoor, RH+T	2-wire, current output	Radiation shield, calculated parameters*	IP65
HMS83	Outdoor, RH+T	3-wire, voltage output	Radiation shield, calculated parameters*	IP65

*Output parameters for humidity: relative humidity, dew point temperature, wet bulb temperature, and enthalpy.

Specifications for Models HMW82/83 and TMW82/83

Performance

Operating temperature range	-5 ... +55 °C (+23 ... +131 °F)
Operating humidity range	0 … 100 %RH, non-condensing
RELATIVE HUMIDITY	
Measurement range	0 ... 100 %RH
Accuracy	
Temperature range	+10 ... +30 °C (+50 ... +86 °F)
0 ... 70 %RH	±3 %RH
70 ... 100 %RH	±5 %RH
Temperature range	-5 ... +10 °C, +30 ... + 55 °C (+23 ... +50 °F, +86 ... +131 °F)
0 …100 %RH	±7 %RH
Stability in typical HVAC applications	±2 %RH over 2 years
Humidity sensor	Vaisala INTERCAP®
TEMPERATURE	
Measurement range	-5 ... +55 °C (+23 ... +131 °F)
Accuracy	
+10 ... +30 °C (+50 °F ... +86 °F)	±0.5 °C (±0.9 °F)
-5 ... +10 °C, +30 ... +55 °C (+23 ... +50 °F, +86 ... +131 °F)	±1.0 °C (±1.8 °F)
Temperature sensor	Digital temperature sensor

Specifications for Models HMD82/83, TMD82/83, HMW88/89, and HMS82/83

Performance

Operating temperature range	-40 ... +60 °C (-40 ... +140 °F)
Operating humidity range	0 ... 100 %RH
RELATIVE HUMIDITY	
Measurement range	0 ... 100 %RH
Accuracy	
Temperature range	+10 ... +30 °C (+50 ... +86 °F)
0 ... 90 %RH	±3 %RH
90 … 100 %RH	±5 %RH
Temperature range	-20 ... +10° C, +30 ... +60 °C (-4 ... +50 °F, +86 ... +140 °F)
0 … 90 %RH	±5 %RH
90 … 100 %RH	±7 %RH
Temperature range	-40 ... -20 °C (-40 ... -4 °F)
0 ... 100%RH	±7 %RH
Stability in typical HVAC applications	±2 %RH over 2 years
Humidity sensor	Vaisala INTERCAP®
TEMPERATURE	
Measurement range	-40 ... +60 °C (-40 ... +140 °F)
Accuracy	
At +20 °C (+68 °F)	±0.3 °C (±0.54 °F)
Temperature dependence	±0.01 °C/ °C
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751
CALCULATED PARAMETERS	
Measurement range for dew point temperature and wet bulb temperature	-40 ... +60 °C (-40 ... +140 °F)
Measurement range for enthalpy	-40 ... 460 kJ/kg (-10 ... +190 BTU/lb)

Technical Data

Specifications for Models HMD82/83D and HMW88/89D

Performance

Operating temperature range	-5 … +60 °C (+23 … +140 °F)
Operating humidity range	0…100 %RH, non-condensing
RELATIVE HUMIDITY	
Measurement range	0 … 100 %RH
Accuracy	
Temperature range	+10 ... +30 °C (+50 ... +86 °F)
0 ... 90 %RH	±3 %RH
90 … 100 %RH	±5 %RH
Temperature range	-5 ... +10 °C, +30 ... +60 °C (+23 ... +50 °F, +86 ... +140 °F)
0 … 90 %RH	±5 %RH
90 … 100 %RH	±7 %RH
Stability in typical HVAC applications	±2 %RH over 2 years
Humidity sensor	Vaisala INTERCAP®
TEMPERATURE	
Measurement range	(Analog output scaling) -40 ... +60 °C (-40 ... +140 °F)
Operating temperature range of the display	+5 ... +60 °C (+23 ... +140 °F)
Accuracy	
At +20 °C (+68 °F)	±0.3 °C (±0.54 °F)
Temperature dependence	±0.01 °C/ °C
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751
CALCULATED PARAMETERS	
Measurement range for dew point temperature and wet bulb temperature	-40 ... +60 °C (-40 ... +140 °F)
Measurement range for enthalpy	-40…460 kJ/kg (-10…+190 BTU/lb)

Operating Environment (All Models)

Operating Environment (All Models)	See model specifications
Maximum wind/flow speed	30 m/s
Storage temperature	-40 ... +60 °C (-40 ... +140 °F)
Electromagnetic compliance	EN61326-1, Industrial Environment

Mechanics

Max wire size	1.5 mm² (AWG 16)
Standard housing color	White (RAL9003)
Housing material	
HMW82/83, TMW82/83	ABS/PC (UL-V0 approved)
HMW88/89(D), HMD82/83(D), TMD82/83, HMS82/83	PC + 10%GF (UL-V0 approved)

Inputs and Outputs

Current output models (2-wire)	
Outputs	4 ... 20 mA, loop powered
Loop resistance	0 ... 600 Ω
Supply voltage	20 ... 28VDC at 600 Ω load 10 ... 28VDC at 0 Ω load
Voltage output models (3-wire)	
Outputs	0...10 V
Load resistance	10 kΩ min
Supply voltage	18 ... 35 VDC 24 VAC ±20 % 50/60 Hz

Spare Parts and Accessories

INTERCAP® sensor	15778HM
10 pcs of INTERCAP® sensors	INTERCAPSET-10PCS
Conduit fitting + O-ring (M16x1.5 / NPT1/2 Inch)	210675SP
Conduit fitting + O-ring (M16x1.5 / PG9, RE-MS)	210674SP
Fastening set HMS80	237805
Porous PTFE Filter	DRW239993SP
Membrane Filter	ASM210856SP
Terminal Block, Blue	236620SP
HMD80 display lid	ASM210793SP

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HMS80 Series Humidity and Temperature Transmitters for Outdoor Measurements in Building Automation Applications

HMS80 Series Humidity and Temperature Transmitters with integrated radiation shields.

Features/Benefits

- Reliable outdoor transmitters with integrated radiation shields
- ±3 %RH accuracy
- User-exchangeable INTERCAP® sensor for easy field replacement
- Default output parameters are relative humidity and temperature. Dew point temperature, wet bulb temperature, and enthalpy outputs selectable using dip switches.
- Options for both current and voltage outputs
- Ingress protection IP65

Vaisala INTERCAP® Humidity and Temperature Transmitter Series HMS80 are designed for outdoor measurements in various building automation applications. These ±3% transmitters include an integrated radiation shield to reduce the influence of solar radiation on temperature and humidity measurements.

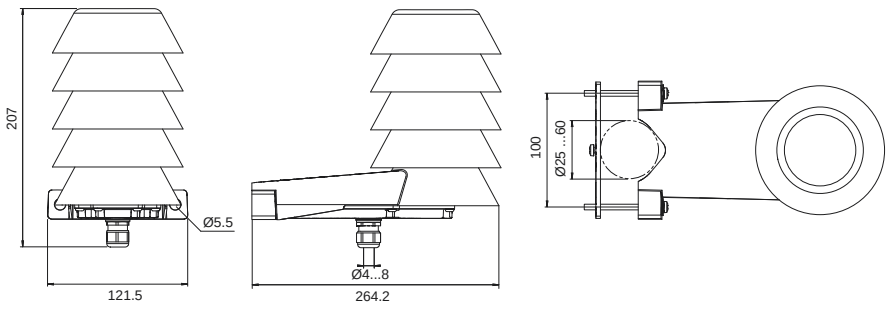
For fast and convenient configuration, the most popular control parameters in free cooling control – dew point temperature, wet bulb temperature, and enthalpy – are selectable using dip switches.

Low Maintenance

HMS80 series transmitters require minimal maintenance thanks to their excellent sensor stability and high-quality materials. If necessary, the INTERCAP® sensor can easily be replaced in the field with minimum downtime.

Easy Installation

HMS80 transmitters are easy to install. They can be mounted directly onto a wall or pole without any extra accessories. There are no loose parts, screws are retained in the enclosure, all connectors are clearly labeled, and the connectors are within easy reach.



Technical Data

Models

MODEL NUMBER	TYPE	OUTPUT	INGRESS PROTECTION
HMS82	Outdoor, RH+T	2-wire, current output	IP65
HMS83	Outdoor, RH+T	3-wire, voltage output	IP65

Performance

RELATIVE HUMIDITY	
Measurement range	0 ... 100 %RH
Accuracy	
Temperature range	+10 ... +30 °C (+50 ... +86 °F)
0 ... 90 %RH	±3 %RH
90 … 100 %RH	±5 %RH
Temperature range	-20 ... +10 °C, +30 ... +60 °C (-4 ... +50 °F, +86 ... +140 °F)
0 … 90 %RH	±5 %RH
90 … 100 %RH	±7 %RH
Temperature range	-40 ... -20 °C (-40 ... -4 °F)
0 ... 100%RH	±7 %RH
Stability in typical HVAC applications	±2 %RH over 2 years
Humidity sensor	Vaisala INTERCAP®
TEMPERATURE	
Measurement range	-40 ... +60 °C (-40 ... +140 °F)
Accuracy	
At +20 °C (+68 °F)	±0.3 °C (±0.54 °F)
Temperature dependence	±0.01 °C/ °C
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751
CALCULATED PARAMETERS	
Measurement range for dew point temperature and wet bulb temperature	-40 ... +60 °C (-40 ... +140 °F)
Measurement range for enthalpy	-40 ... 460 kJ/kg (-10 ... +190 BTU/lb)
Accuracy of the calculated parameters should be calculated at the actual condition based on the relative humidity and temperature specification. Accuracy at 20°C (68°F) and 80%RH:	
Dew point	±0.9 °C (1.6 °F)
Wet bulb temperature	±0.7 °C (1.3 °F)
Enthalpy	±2kJ/kg (0.9 BTU/lb)

Operating Environment

Operating temperature range	-40 ... +60 °C (-40 ... +140 °F)
Operating humidity range	0 ... 100 %RH
Maximum wind/flow speed	30 m/s
Storage temperature	-40 ... +60 °C (-40 ... +140 °F)
Electromagnetic compliance	EN61326-1, Industrial Environment

Mechanics

Max wire size	1.5 mm² (AWG 16)
Standard housing color	White (RAL9003)
Housing material	PC + 10%GF (UL-V0 approved)

Inputs and Outputs

Current output model HMS82 (2-wire)	
Outputs	4 ... 20 mA, loop powered
Loop resistance	0 ... 600 Ω
Supply voltage	20 ... 28VDC at 600 Ω load 10 ... 28VDC at 0 Ω load
Voltage output model HMS83 (3-wire)	
Outputs	0...10 V
Load resistance	10 kΩ min
Supply voltage	18 ... 35 VDC 24 VAC ±20 % 50/60 Hz

Spare Parts and Accessories

INTERCAP® sensor	15778HM
10 pcs of INTERCAP® sensors	INTERCAPSET-10PCS
Conduit fitting + O-ring (M16x1.5 / NPT1/2 Inch)	210675SP
Conduit fitting + O-ring (M16x1.5 / PG9, RE-MS)	210674SP
Fastening set HMS80	237805
Membrane Filter	ASM210856SP
Terminal Block, Blue	236620SP

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HMS110 Series Humidity and Temperature Transmitters for High-Accuracy Outdoor Measurements in Building Automation Applications

HMS110 Series Humidity and Temperature Transmitters with HUMICAP® sensor.

Features/Benefits

- Reliable outdoor transmitters with integrated radiation shields
- ±2 %RH accuracy
- Proven HUMICAP® 180R sensor for long-lasting accuracy
- 3-point NIST traceable calibration (certificate included)
- Default output parameters are relative humidity and temperature. Dew point temperature, wet bulb temperature, and enthalpy outputs selectable with a PC connection.
- Current output (4...20 mA)
- On-site calibration with HM70 Hand-Held Meter or PC connection
- Ingress protection IP65

Vaisala HUMICAP® Humidity and Temperature Transmitter Series HMS110 are designed for demanding outdoor measurements in building automation applications. These ±2% transmitters include an integrated radiation shield to reduce the influence of solar radiation on temperature and humidity measurements.

Proven Vaisala HUMICAP® Performance for Outdoor Measurements

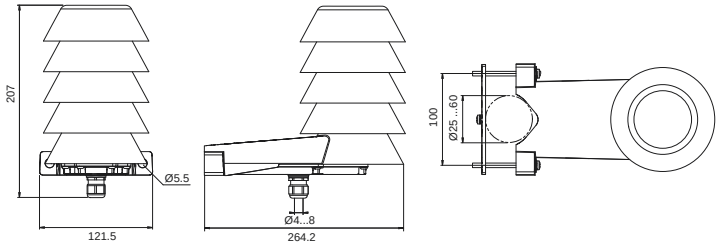
HMS110 transmitters are equipped with the trusted HUMICAP® 180R – a robust, general-purpose humidity sensor that functions well in high humidity. The sensor's superior stability ensures long-lasting accuracy and minimal maintenance throughout the transmitter's lifetime.

The integrated radiation shield allows unrivaled measurement performance, reducing the impact of sunshine on temperature and humidity measurements and ensuring measurement accuracy in outdoor conditions.

Easy Installation and Maintenance

HMS110 transmitters are easy to install. They can be mounted directly onto a wall or pole without any extra accessories. There are no loose parts, screws are retained in the enclosure, all connectors are clearly labeled, and the connectors are within easy reach.

The HUMICAP® sensor's excellent long-term stability and high-quality materials ensure minimal need for maintenance. If necessary, the transmitter can be field-calibrated using either an HM70 Hand-Held Humidity and Temperature Meter, or a PC connection.



Technical Data

Models

MODEL NUMBER	TYPE	OUTPUT	SPECIAL FEATURES	INGRESS PROTECTION
HMS110	Outdoor, RH+T	2-wire, current output	Delivered with customer specific output settings, including calculated humidity parameters and special scaling of outputs.	IP65
HMS112	Outdoor, RH+T	2-wire, current output		IP65

Performance

RELATIVE HUMIDITY	
Measurement range	0 ... 100 %RH
Accuracy	
Temperature range	+10 ... +30 °C (+50 ... +86 °F)
0 ... 90 %RH	±2 %RH
90 … 100 %RH	±3 %RH
Temperature range	-20 ... +10° C, +30 ... +60 °C (-4 ... +50 °F, +86 ... +140 °F)
0 … 90 %RH	±3 %RH
90 … 100 %RH	±4 %RH
Temperature range	-40 ... -20 °C (-40 ... -4 °F)
0 ... 100%RH	±4 %RH
Stability in typical HVAC applications	±0.5 %RH/year
Humidity sensor	Vaisala HUMICAP® 180R
TEMPERATURE	
Measurement range	-40 ... +60 °C (-40 ... +140 °F)
Accuracy	
At +20 °C (+68 °F)	±0.3 °C (±0.54 °F)
Temperature dependence	±0.01 °C/ °C
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751
CALCULATED PARAMETERS	
Measurement range for dew point temperature and wet bulb temperature	-40 ... +60 °C (-40 ... +140 °F)
Measurement range for enthalpy	-40 ... 460 kJ/kg (-10 ... +190 BTU/lb)
Accuracy of the calculated parameters should be calculated at the actual condition based on the RH and temperature specification. Accuracy at 20°C (68°F) and 80%RH:	
Dew point	±0.7°C (1.2°F)
Wet bulb temperature	±0.5°C (0.9°F)
Enthalpy	±1.6kJ/kg (0.7 BTU/lb

Operating Environment

Operating temperature range	-40 ... +60 °C (-40 ... +140 °F)
Operating humidity range	0 ... 100 %RH
Maximum wind/flow speed	30 m/s
Storage temperature	-40 ... +60 °C (-40 ... +140 °F)
Electromagnetic compliance	EN61326-1, Industrial Environment

Mechanics

Max wire size	1.5 mm² (AWG 16)
Standard housing color	White (RAL9003)
Housing material	PC + 10%GF (UL-V0 approved)

Inputs and Outputs

Analog output	4 ... 20 mA, loop powered
Loop resistance	0 ... 600 Ω
Supply voltage	20 ... 28VDC at 600 Ω load 10 ... 28VDC at 0 Ω load
Data input for RDP100 Remote Panel Display	RS485, Vaisala proprietary protocol

Spare Parts and Accessories

Remote Panel Display	RDP100
Conduit fitting + O-ring (M16x1.5 / NPT1/2 Inch)	210675SP
Conduit fitting + O-ring (M16x1.5 / PG9, RE-MS)	210674SP
Fastening set HMS110	237805
Membrane Filter	ASM210856SP
Terminal Block, Blue	236620SP
USB cable for PC connection	219690
Connection cable for HM70 hand-held meter	219980SP
HUMICAP® 180R sensor	HUMICAP180R

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HMW90 Series Humidity and Temperature Transmitters for High Performance HVAC Applications

The HMW90 Series Humidity and Temperature Transmitters are designed for demanding HVAC applications.

Features/Benefits

- Both analog and digital output
- Easy installation, configuration, and field adjustment
- Humidity parameter options: relative humidity, dew point, mixing ratio, enthalpy, wet bulb temperature, dew point depression, and absolute humidity
- Full 0 ... 100%RH measurement range
- Up to ±1.7%RH accuracy
- User exchangeable humidity and temperature module
- NIST traceable calibration (certificate included)
- Available in four colors

BACnet in Brief

- A data communication protocol for Building Automation and Control networks
- Used in management, automation and field level communication
- ANSI/ISO/ASHRAE standard controlled by a standardization body
- Adds flexibility by allowing the integration of products and systems from different manufacturers

Wall-mounted Vaisala HMW90 Series HUMICAP® Humidity and Temperature Transmitters measure relative humidity and temperature in indoor HVAC applications, where high accuracy, stability, and reliable operation are required.

The flexible HMW90 series offers a variety of options and features. Transmitters include a display and a sliding cover with either an opening for the display or a solid front. Both analog and digital output options, including special scalings and calculated parameters, are available.

Quick and Easy to Install

HMW90 series transmitters are quick and easy to install. The wiring is connected through the back plate and the electronics with the sensors can be snapped on easily after the wiring is complete. The transmitter is configured using dip switches, which are accessible when the enclosure is open.

Digital Communication Brings Benefits

The introduction of digital (BACnet/Modbus) communication to field level devices brings many advantages. For example, all sensors can be centrally accessed and their performance can be easily monitored. Wiring is simple when multiple sensors are installed on the same bus. Sensors can be set up using standardized tools, and the system can be enlarged with additional sensors quickly and conveniently. In addition, parameters influencing measurements, such as pressure or site elevation, can be centrally set and updated.

Choose from a Wide Variety of Calibration Options

On-site calibration and adjustment is exceptionally easy. The sliding cover exposes offset trimmers for one-point calibration without disturbing measurement. The display instantly indicates the effects of changes, making it clear and convenient to make adjustments. A service port enables two-point calibration, using either a PC or the Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM70. HMW90 series transmitters include a user-exchangeable measurement module, which can be ordered as a spare part. Calibration services are available through all Vaisala Service Centers.

Technical Data

Models

TMW92	T-only	2-wire, current output
TMW93	T-only	3-wire, voltage output
TMW90	T-only	configurable analog output model
HMW92	RH+T	2-wire, current output
HMW92D	RH+T	2-wire, current output with display
HMW93	RH+T	3-wire, voltage output
HMW93D	RH+T	3-wire, voltage output with display
HMW90	RH+T	Configurable analog/digital model
HMW95	RH+T	Digital (BACnet, Modbus) model
HMW95D	RH+T	Digital (BACnet, Modbus) model with display

Performance

RELATIVE HUMIDITY	
Measurement range	0 ... 100 %RH, non-condensing
Accuracy	
Temperature range	+10 ... +40 °C (+50 ... +104 °F)
0 ... 90 %RH	±1.7 %RH
90 ... 100 %RH	±2.5 %RH
Temperature range	-5 ... +10 °C, +40 ... + 55 °C (+23 ... +50 °F, +104 ... +131°F)
0 ... 90 %RH	±3 %RH
90 ... 100 %RH	±4 %RH
Stability in typical HVAC applications	±0.5 %RH/year
Humidity sensor	Vaisala HUMICAP® 180R
TEMPERATURE	
Measurement range	-5 ... +55 °C (+23 ... +131 °F)
Accuracy	
+20 ... +30 °C (+68 ... +86 °F)	±0.2 °C (± 0.36 °F)
+10 ... +20 °C, +30 ... +40°C (+50 ... +68 °F, +86 ... +104 °F)	±0.3 °C (± 0.54 °F)
-5 ... +10 °C, +40...+55°C (+23 ... +50 °F, +104 ... +131 °F)	±0.5 °C (± 0.90 °F)
Temperature sensor	Digital temperature sensor

Operating Environment

Operating temperature range	-5 ... +55 °C (+23 ... +131 °F)
Storage temperature range	-30 ... +60 °C (-22 ... +140 °F)
Electromagnetic compliance	EN61326-1, Industrial Environment

Spare Parts and Accessories

Humidity and Temperature Module	HTM10SP
Temperature Module (for T-only models)	TM10SP
Decorative cover set (10 pcs.)	236285
Connection cable for HM70 hand-held meter	219980
USB cable for PC connection	219690

Mechanics

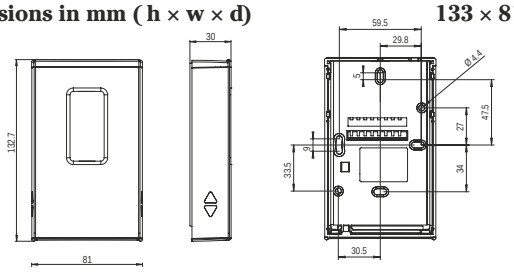
IP class	IP30
Standard housing color	White (RAL9003*)
Optional housing colors	Black (RAL9005*)
(configurable models only)	Grey (RAL7035*)
	Light Ivory (RAL1015*)
Housing material	ABS/PC, UL-V0 approved
Output connector	Screw terminals
	max. wire size 2 mm² (AWG14)
Service port connector	4-pin M8
Weight	155 g

**RAL code is only indicative with potential small variations in color shade*

Inputs and Outputs

Current output models	
Outputs	2 x 4 ... 20 mA, loop powered
Loop resistance	0 ... 600 Ω
Supply voltage	20 ... 28 VDC at 500 Ω load
	10 ... 28 VDC at 0 Ω load
Isolation between output channels	500 VDC
Voltage output models	
Outputs	2 × 0...5 V or 2 × 0...10 V
Load resistance	10 kΩ min.
Supply voltage	18 ... 35 VDC, 24 VAC ±20 % 50/60 Hz
Max. current consumption	12 mA
	max. with relay 25 mA
Relay	1 pc (max. 50 VDC, 500 mA)
Digital models	
Supply voltage	18 … 35 VDC, 24 VAC ± 20% 50/60 Hz
Max. current consumption (with 120 Ω termination)	30 mA at 24 VDC
Output type	RS-485 (galvanic isolation, 1.5 kV)
RS-485 end of line termination	Enable with jumper, 120 Ω
Supported protocols	Selectable by DIP switch
BACnet MS/TP	
Operating mode	Selectable Master/Slave
Address range, master mode	0 … 127
Address range, slave mode	128…255
Modbus RTU	
Address range	0 … 247
Service port	RS-485 line for temporary service use

Dimensions in mm (h × w × d) **133 × 81 × 30**



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